



# Diary

## Research Results

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تحقیقی نتائج

**CLICK ON TOPICS TO JUMP ON THEM DIRECTLY**

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## Getting Started

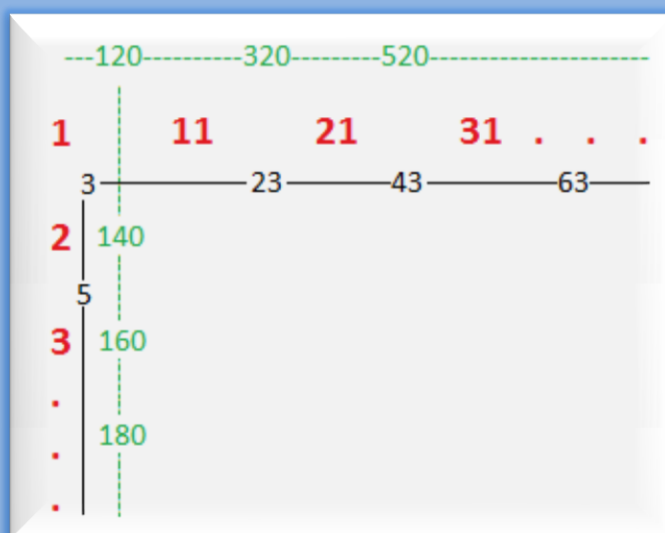
I started the research on squares of number and their specialties and found amazing results. I was actually curious about the matter that **If we know the square of 25(i.e.  $25^2$ ) ... why we don't know that of 625(i.e.  $625^2$ )** . I found it (in 2011) and sharing with you now. Don't take it as MATHEMATICS...Take it as "MATHE-MAGICS". You can use this method (I have named it on my nick name Shakes as "Shakes Method") for "squaring numbers by simple addition and subtraction". We can square the numbers easily by knowing the squares of nearest number.

I tabulated the squares and found that the distance between the squares is increasing (going ahead) by 2. Also, ongoing horizontally (i.e: 1 to 11, 2 to 22 etc.) the distances are special and increases by 2. I took a look on horizontal distances vertically and found them also increasing by 2.

Can't you understand? My observation is tabulated as below: ♦♦

1	3	120	121	23	320	441	43	520	961	63
4	5	140	144	25	340	481	45	540	1024	65
9	7	160	169	27	360	529	47	560	1089	67
16	9	180	196	29	380	576	49	580	1156	69
25	11	200	225	31	400	625	51	600	1225	71
36	13	220	256	33	420	676	53	620	1296	73
49	15	240	289	35	440	729	55	640	1369	75
64	17	260	324	37	460	784	57	660	1444	77
81	19	280	361	39	480	841	59	680	1521	79
100	21	300	400	41	500	900	61	700	1600	81

### A Brief Schematic Diagram of Above Table



Suppose, we want to find the square of 36 and you already know the square of nearest number (35) which is 1225. So, look at the table and just add 71 in 1225 to get the square of 36.

$$\begin{array}{r} 1225 \\ + 71 \\ \hline \end{array}$$

1296
------

: the square of 36
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Also, if horizontally, we know the square of 14 which is 196 and want to square 24. Then refer table; simply you have to add 380 in 196 which gives you 24 the whole square.

196

+380

576
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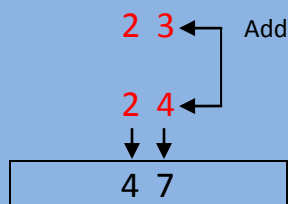
: the square of 24
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After achieving successful results, I started thinking on the reality that “at the time of calculation, there will be no table in front of you.” Then how to calculate the distance between squares of two numbers? I got it....Let’s Understand.

## Method of Finding The Distance Between Squares of Two numbers

**Vertically:** Consider we want to find the distance between the squares of 23 & 24. Adding both consecutive numbers gives you the distance between the squares of 23 & 24 as 47.

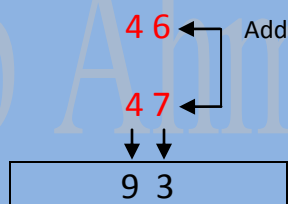
Above calculation can be represented as follows:



You can refer above table to confirm your result.

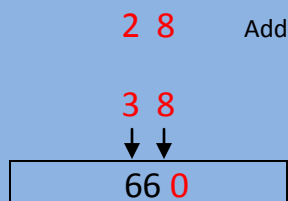
Let's check out another.

Distance between the squares of 46 & 47 is represented below.



Now, we can find distance between squares of any two numbers VERTICALLY.

**Horizontally** Consider we want to find the distance between squares of 28 & 38. All we have to do is just add both of them "followed by one zero". It can be shown as follows:



Just check in the table... isn't it right?

## No Matter

It is not the matter that how big the numbers are. Suppose we have to find distance between sq. of 263 and 264, procedure will be same (Vertical Process). It can be calculated as under:

$$\begin{array}{r} 263 \leftarrow \text{Add} \\ 264 \leftarrow \\ \hline 527 \end{array}$$

And we have to do same for Horizontal Process. Suppose we have to find distance between sq. of 254 and 264, It can be calculated as under:

$$\begin{array}{r} 254 \leftarrow \text{Add} \\ 264 \leftarrow \\ \hline 5180 \end{array}$$

## Jumping The Distances

Sometimes, we do not know the square of exactly previous or next number. In these cases, mostly we know the squares of 10's digit, 15's digit or 20's digit. Consider we have to find square of 28 and we don't know the square of either 27 or 29 but we know sq. of 30 (i.e:900). In this situation, what will you do? *Perhaps you will advice to subtract "distance bet<sup>n</sup>. squares of 28&29 plus 29&30" from 900.*

$$\begin{array}{r} \text{Distance bet}^n. \text{ sq. of } 28\&29 \longrightarrow 57 \leftarrow \text{Add} \\ \text{Distance bet}^n. \text{ sq. of } 29\&30 \longrightarrow 59 \leftarrow \\ \hline 116 \end{array}$$

Subtracting this no. from 900 gives you actual answer.

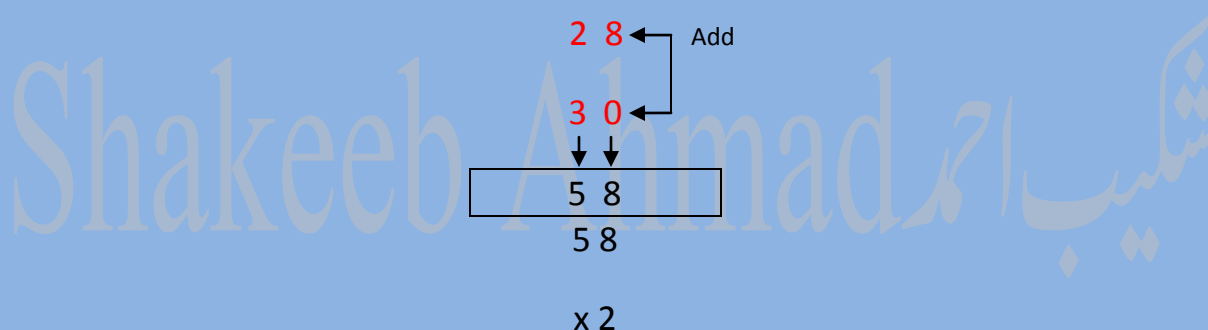
900

- 116

784
: the square of 28

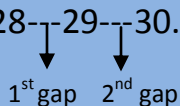
But by this add<sup>n</sup>. of distance bet<sup>n</sup>. squares, our more time will loss. So, I discovered the direct method of finding it.

In above example, we have to find distance bet<sup>n</sup>. the sq. of 28 & 30. With a slight change, we will do as we done previously. In above example, we have to find distance bet<sup>n</sup>. the sq. of 28 & 30. With a slight change, we will do the same as we have done previously.



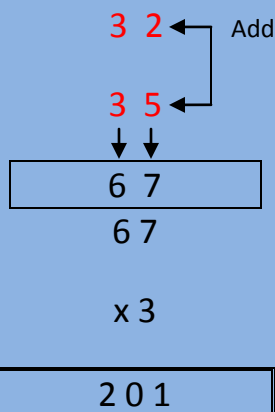
So, the distance between the squares of 28 & 30 is 116...simple.

We have multiplied the number 58( obtained by our operations) by 2 since there is the gap of two distances...28--29--30.



If there are more gaps, we will multiply by corresponding number of gaps.

Try another. Distance between the sq. of 32 & 35 is given by...

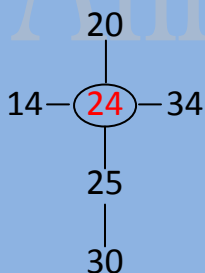


So, by using this method, we can effectively find the squares of numbers by knowing the squares of their nearest number. Some of the examples are given below.

### Actual Use of “Shakes Method”

Example1:  $(24)^2 = ?$  ----(under consideration that you don't know the square of 24)

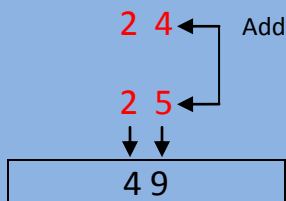
Look the numbers near 24 , the square of which we already know.



You can solve the problem by knowing any of these five *sang-e-meel* سنگِ میل.

(Milestones)[Not only these five, you can also use any no. suits you comfortably.]

**With the help of 25:** If we know the square of 25.....which is 625. Calculate distance between squares of 24 & 25 and subtract it from 625 to get your answer.





Doing easy subtraction, we get.....

6 2 5

- 4 9

5 7 6

: the square of 24

**With the help of 20:** If we know the square of 20.....which is 400. Calculate distance between squares of 20 & 24 and Add it to 400 to get your answer.

2 0 ← Add

2 4 ←

↓ ↓

4 4

4 4

x 4

176

Doing easy addition, we get.....

4 0 0

+ 1 7 6

5 7 6

: the square of 24

Hope so, you can do it with the help of 30,14 etc. (As a Homework...Hah!) Just see. I want to show you that you can even find 24 the whole square with the help of "4". Don't you believe...Go on!

**With the help of 4:** If we know the square of 4.....which is 16. Calculate distance between squares of 4 & 24 and Add it to 16 to get your answer.

$$\begin{array}{r}
 \text{Add} \swarrow \\
 4 \\
 \downarrow \\
 2 \quad 4 \\
 \downarrow \quad \downarrow \\
 \boxed{28} \\
 28 \\
 \times 2 \\
 \boxed{560}
 \end{array}$$

Doing easy addition, we get.....

$$\begin{array}{r}
 16 \\
 + 560 \\
 \hline
 \boxed{576} \\
 \text{: the square of 24}
 \end{array}$$

Isn't it amazing to find square only by simple addition or subtraction!!!???

Try another.

Example2:  $(74)^2 = ?$

Look the numbers near 74 , the square of which we already know.

$$\begin{array}{c}
 70 \\
 | \\
 64 - \boxed{74} - 84 \\
 | \\
 75 \\
 | \\
 80
 \end{array}$$

You can solve the problem by knowing any of these five *sang-e-meel* سنگِ میل.

**With the help of 75:** If we know the square of 75.....which is 5625(calculating the squares of numbers having '5' in unity have a special and easy method and can be

found anywhere in the internet). Calculate distance between squares of 74 & 75 and subtract it from 5625 to get your answer.

$$\begin{array}{r}
 74 \\
 75 \\
 \hline
 149
 \end{array}$$

Add

Doing easy subtraction, we get.....

$$5625$$

$$- 149$$

$$5476$$

: the square of 74

**With the help of 70:** If we know the square of 70.....which is 4900. Calculate distance between squares of 70 & 74 and Add it to 4900 to get your answer.

$$\begin{array}{r}
 70 \\
 74 \\
 \hline
 144
 \end{array}$$

Add

$$144$$

$$\times 4$$

$$576$$

Doing easy addition, we get.....

$$4900$$

$$+ 576$$

5 4 7 6

: the square of 74

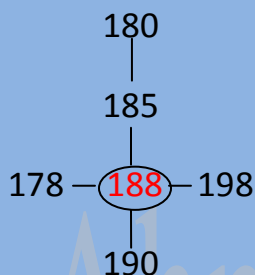
You can find the same answer by using other numbers also... according to your comfort.

Isn't it amazing to find square only by simple addition or subtraction!!!???

Try the last.

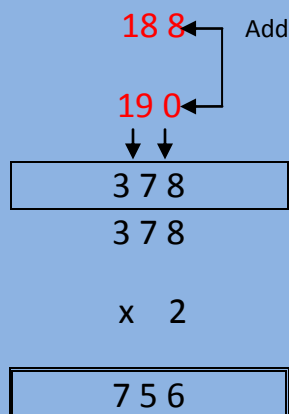
Example3:  $(188)^2 = ?$

Look the numbers near 188 , the square of which we already know.



You can solve the problem by knowing any of these five *sang-e-meel* سنگِ میل.

**With the help of 190:** If we know the square of 190.....which is 36100. Calculate distance between squares of 188 & 190 and subtract it from 36100 to get your answer.



Doing easy subtraction, we get.....

3 6 1 0 0

- 7 5 6

3 5 3 4 4

: the square of 188

**Note:** The same method mentioned under the topic “jumping the distances” can be used to find the distance bet<sup>n</sup>.sq. of 100’s, 1000’s (i.e: distance between the squares of 12 & 112, 12 & 212 and 12 & 1012, 12 & 2012 etc.) etc. **Means using 13...you can find square of 2013, using 25...you can find square of 625 etc.** If you are unable to understand it then reply to me through comment or email at

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Is it helpful or not? Please comment about your experiences.

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The End... ختم شد